DOCUMENT RESUME

ED 041 210 AC 008 111

AUTHOR	Sharma, D. K.; Leagans, J. Paul
TITLE	Information Sources and Communication Channels Related to Farm Practice Adoption in Central India.
INSTITUTION	State Univ. of New York, Ithaca. Coll. of Agriculture at Cornell.
PUB DATE	[68]
NOTE	31p.
AVAILABLE FROM	Department of Education, New York State College of Agriculture, Ithaca, New York (Single copy free; additional copies 25¢ each)
EDRS PRICE	EDRS Price MF-$0.25 HC-$1.65
DESCRIPTORS	*Adoption (Ideas), *Adult Farmer Education, Age Differences, Audiovisual Aids, *Communication (Thought Transfer), Educational Background, Extension Agents, *Farm Management, Films, *Information Sources, Mass Media, Meetings, Participation, Reading Materials, Research, Socioeconomic Status, University Extension
IDENTIFIERS	India

ABSTRACT

The study's main purpose was to identify and describe the roles played by various information sources and communication channels used by Sehore farmers in the adoption of four improved agricultural practices in U.P. District of India. A sample of randomly picked 200 farmers was interviewed by questionnaire. Of the five information sources studied, neighbors were named by all respondents, village level workers by 72%, village chairmen by 26%, and agricultural and university personnel by 20% and 17% respectively. Among the seven means of communication, film demonstrations led by 50%, followed by radio with 38%, audiovisual aids, general meetings, and reading materials. Five adoption stages were recognized: awareness, interest, evaluation, trial, and decision to adopt. Age, education, caste and economic status were discriminating factors, singly or in combination, in the use of all sources except neighbors and village local workers. One major finding was that face to face contacts between agents and farmers had the greatest influence, and mass media the least influence on the adoption. (PT)

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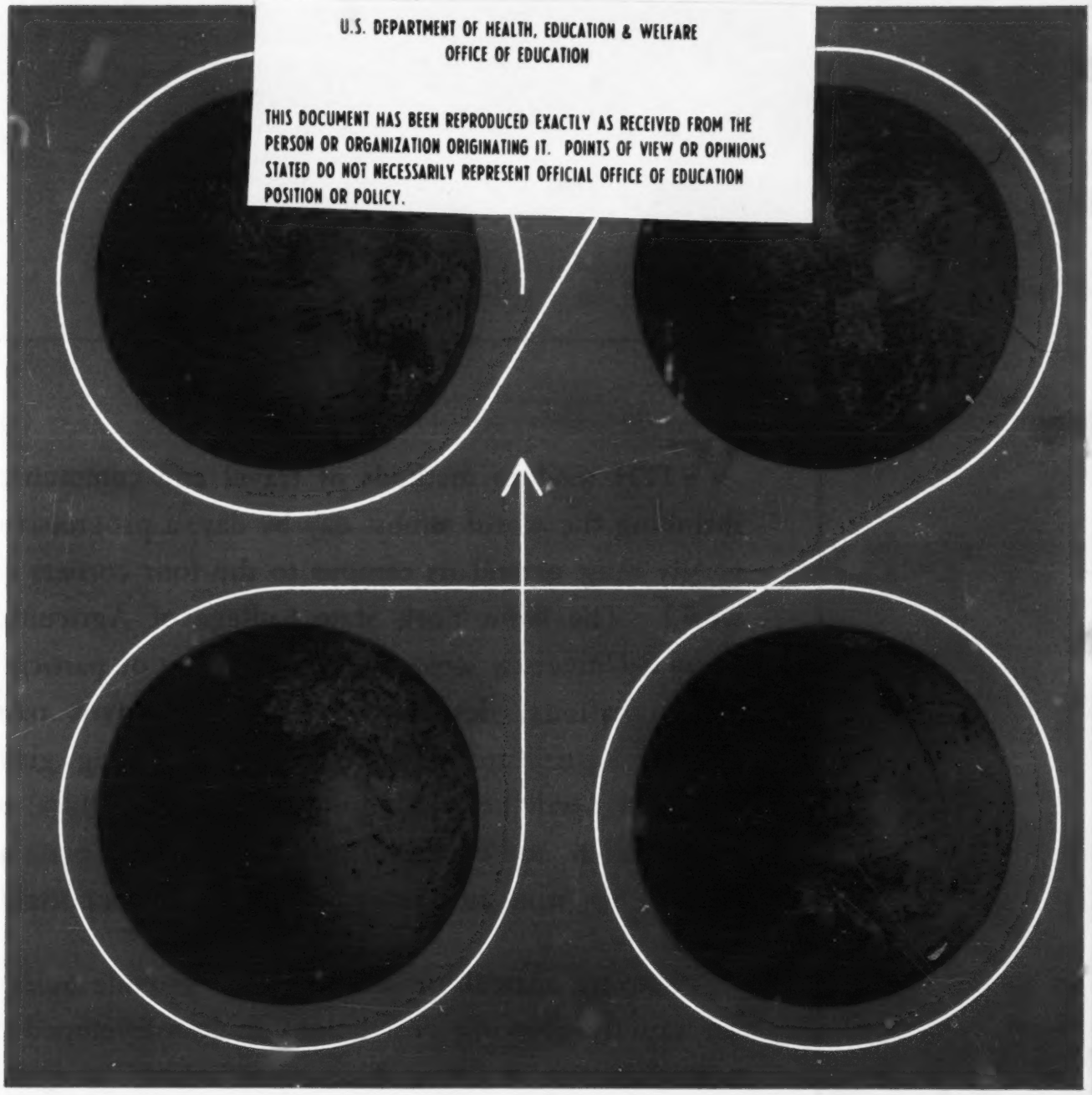

Information Sources and Communication Channels Related to Farm Practice Adoption in Central India

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INFORMATION SOURCES AND COMMUNICATION CHANNELS RELATED TO FARM PRACTICE ADOPTION IN CENTRAL INDIA

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INFORMATION SOURCES AND COMMUNICATION CHANNELS RELATED TO FARM PRACTICE ADOPTION IN CENTRAL INDIA[1]

Introduction

The processes whereby improved farm practices are diffused among agricultural populations have been extensively researched in the United States and other technologically developed nations. But this vitally important area of research has been almost unexplored in many of the world's newly developing countries. Hence, extension educators, administrators, supervisors, and others who are involved in planning and implementing programs of developmental change in agriculture are badly in need of more and better knowledge about the processes through which farmers adopt new technologies.

This bulletin reports results from a study of farm practice adoption in the Sehore Block of India's National Extension Service in Madhaya Pradesh.[2] The study sought to identify information sources and channels of communication used by farmers in the adoption of four recently introduced farm practices.[3] The aim was to describe the roles played by identified communication sources and channels at each stage of the adoption process. An increased understanding of these roles and the factors associated with them is essential not only to the development of more effective

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[1]The authors acknowledge with appreciation the valuable assistance of Douglas R. Pickett, Research Associate, in preparing the manuscript.

[2]The primary data are synthesized from the Ph. D. dissertation in Extension Education by D. K. Sharma, August, 1967, Cornell University.

[3]The four practices were: use of an improved wheat variety, chemical fertilizers, fungicides, and the mould board plow.

communication strategies for use by extension workers at the local level, but also to the empirical testing of some frequently stated cross-cultural generalizations based on American research findings.

For years India has been in the grip of chronic food shortages. Yet there exists in her research stations a large and growing body of technological information which, if properly applied by farmers, could contribute greatly to the solution of this critical problem. One of the fundamental tasks of the extension service in India, as elsewhere, is to narrow the gap between what scientists know and farmers do. If this task is to be accomplished, extension workers have to greatly increase their skill in the art of communicating technology. The adoption of better farming practices is contingent upon communicating information about them to farmers. A better understanding of the roles played by various sources and channels at each stage of the adoption process is prerequisite to effective communication in agricultural development.

Objectives of the Study

The study's main purpose was to identify and describe the roles played by various information sources and communication channels used by Sehore farmers in the adoption of four improved agricultural practices. Operationally, this purpose was sub-divided into four primary objectives:

1. To identify the communication sources and channels in general use.
2. To identify the relations between communication sources and channels and their use at each of five stages of the adoption process.
3. To analyze the relative influence of communication sources and channels at each stage of the adoption process.
4. To identify the relations between communication sources and channels and selected socio-economic variables.

Theoretical Base

Two major theoretical constructs formed the base on which the study was designed. The first of these dealt with communication as a process in agricultural extension; the second viewed adoption as a progressive, five-stage process through which farmers pass in deciding whether to accept and follow a particular improved farm practice.

Communication has been extensively studied in both its theoretical and applied dimensions. A wide range of conceptual formulations is readily available in the literature of the social sciences. While no one of these formulations may be taken as theoretically sound and empirically valid for all purposes and in all places, identifiable among their diverse orientations are a number of central ideas that have gained general acceptance. Among these are the following notions, each of which is essential to the arguments on which the study depends.

For the purposes of this study, communication is generally defined as "the process by which two or more people exchange ideas, facts, feelings, or impressions in ways that each gains a common understanding of the meaning, intent and use of messages. In essence, it is the act of getting a sender and receiver tuned together for a particular message, or a series of messages."[1] This broad definition leads to a conceptual delimitation of communication as a process in extension education: the process of transmitting knowledge, skills, attitudes, and descriptions of appropriate technological behavior in a manner such that they are understood, accepted, and used advantageously by farmers.

The communication process as it has here been defined is conceived by extension educators to consist of six key elements:

Communicator -- person who originates, encodes, and transmits a message.

Message -- information a communicator wishes his audience to receive, understand, and act upon.

Communication Channels -- the means by which a sender and receiver of a message are connected.

Message Treatment -- the technical and procedural manner in which messages are presented.

Audience -- intended receiver(s) of a message.

Audience Response -- action taken by an audience in response to a message received.

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[1]Leagans, J. Paul, The Communication Process in Rural Development, (Ithaca, New York: Cornell University, International Agricultural Development Bulletin, No. 1, 1963), p. 5.

As is the case with communication, theoretical formulations of the adoption process are widely divergent. No single one of them appears either universally acceptable or applicable. Again, however, through most of these formulations run common threads which are important to the purposes of this study.

Adoption is conceived to be a mental process involving a number of successive stages. It is ". . . a process composed of learning, deciding, and acting over a period of time."[1] For analytical purposes, these stages are specified here as: awareness, interest, evaluation, trial, and adoption. But while these five stages are separable for analysis, it is recognized that, in practice, they are highly interdependent and interacting.

A review of adoption and communication studies conducted by leading researchers reveals that various information sources and communication channels perform different functions in the process of improved farm practice adoption. A farmer may, for example, become initially aware of a particular practice from one source or through one channel, use different sources and/or channels to obtain more information about it as his interest is aroused, and evaluate it with the help of still other sources and channels. Similarly, he may use quite different sources and channels at the trial and adoption stages. Moreover, it is clear from research that farmers tend to use multiple sources and channels as they progress through the stages of adoption, and that different sources and channels are used for different farm practices. Also, it is evident that different kinds of farmers use different kinds of channels.

Consideration of these findings led to the selection and definition of the variables examined in the study, and to the research procedures and methods of analysis employed.

Explanatory Factors

While no attempt was made to establish the presence of causal relations among the several factors considered, a "variable map" is here presented

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[1]Wilkening, E. A., as quoted by E. M. Rogers, Diffusion of Innovations (New York: The Free Press of Glencoe, 1952), p. 78.

to illustrate the manner in which the factors were conceived to exist in general relationship one to another:

Independent Variables	Sources	Channels
	Neighbors	Demonstrations
	Sarpanches[1]	Meetings
	Village Level Workers[2]	Radio Programs
	Agricultural Extension Officers[3]	Filmshows
	College Extension Personnel[4]	Exhibitions
		Posters
		Printed Matter
Intervening Variables	Age	
	Education	
	Caste	
	Economic Status	
	Organizational Participation	
Dependent Variables	Awareness	
	Interest	
	Evaluation	
	Trial	
	Adoption	

Methodology

Stratified random sampling techniques were employed to select two hundred farmers representative of agriculturalists living and cultivating

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[1]Elected Presidents of village government councils.

[2]Local functionaries of the National Extension Service, hereinafter referred to as VLWs.

[3]Block level supervisors of VLWs, hereinafter referred to as AEOs.

[4]Personnel of the Sehore Agricultural College, hereinafter referred to as CEPs.

land within the block. This sample consisted of approximately ten percent of the farmers in each of twenty villages randomly selected from among the block's ten village level worker circles.

Respondents were personally interviewed using a pretested, structured questionnaire. The questionnaire was first drawn in English and pretested with graduate students majoring in Extension Education at Cornell University. It was then translated into Hindi and pretested on a sample of twenty farmers in the Sehore area. Useful changes in construction and terminology were made. To estimate reliability, a sample of twenty farmers was re-interviewed after a two-month period. First and second responses were found to correlate highly (rho=.99).

Interviews were conducted at respondents' homes or work places in an informal atmosphere. Responses were recorded on a pre-categorized schedule.

Data were tabulated on IBM equipment. Pearsonian r was used to determine the nature and degree of association between information sources, communication channels, and stages of the adoption process. Chi-square was used to find significant differences in the use of information sources and channels of communication by different groups of farmers, categorized according to their socio-economic characteristics. Regression analyses were conducted to determine the relative influence of identified sources and channels on farmers at the various stages of the adoption process.

Communication Related to Adoption Stages

Five sources of information and seven channels of communication were identified as being in regular use by respondent farmers. Table 1 presents a listing of these sources and channels along with information on the total percentages of sample farmers reporting their use. Among the sources, citations ranged from 100 percent (for neighbors) to 17.5 percent (for CEPs). Demonstrations were the most frequently cited channel (50.5 percent), and printed matter the least cited channel (15 percent).

The following sections present summary statements of important findings relative to the use of these sources and channels at each of the five

Table 1

Frequency and Percentage Distribution of Respondents Reporting Use of Identified Information Sources and Channels in the Adoption of Four Improved Farm Practices

Sources and Channels	Total Number of Citations (N=200)	Percentage
Sources:		
Neighbor	200	100.00
VLW	144	72.50
Sarpanch	53	26.50
AEO	37	18.50
CEP	35	17.50
Channels:		
Demonstration	101	50.50
Radio	77	38.50
Posters	72	36.00
Filmshows	66	33.00
Exhibitions	50	25.00
General Meetings	42	21.00
Printed Matter	30	15.00

stages of adoption. Percentages given in the text and tables refer not to the total sample, but to the total number of farmers who reported having used a given source or channel.

Awareness Stage

At this stage, a farmer first becomes conscious of an improved practice and begins to gain a rudimentary knowledge about it.

All five of the identified information sources were cited by respondents as providing initial knowledge or awareness. But only three of the seven communication channels were mentioned as having played significant roles: posters, exhibits, and filmshows. Radio and printed matter were not mentioned at all, and meetings collected a very small percentage of mentions.

Table 2

Percentage Distribution of Respondents According to Use of Information Sources and Communication Channels at the Awareness Stage

Sources and Channels	Improved Practice			
	Wheat (N=200)	Fertilizer (N=167)	Fungicide (N=136)	Plow (N=100)
Sources:				
Neighbors	72.00	73.00	69.85	68.00*
Sarpanches	26.50	29.00	30.88	26.00*
VLWs	16.50	20.00	23.52	22.00*
AEOs	11.50	15.56	15.44	16.00*
CEPs	15.00	14.00	17.35	22.00*
Channels:				
Posters	35.50	40.71	44.11	47.00*
Filmshows	33.30	38.92	30.14	46.00*
Exhibitions	25.50	31.00	34.55	39.00*
General Meeting	21.00	25.00	27.94	8.00*

*r significant at .01 level.

Among the sources, neighbors ranked first, followed by Sarpanches, VLWs, CEPs, and AEOs. This ranking holds for all of the improved practices except fertilizers, where AEOs replace CEPs as fourth in frequency of mention. These data (Table 2) indicate that local sources tend to be more used at the awareness stage, neighbors being the most important among them.

Of the four channels mentioned (Table 2), posters received the most mentions, followed by filmshows, exhibitions, and meetings, except in the case of fertilizers, where exhibitions outranked filmshows. This differential use of channels may be due to physical factors. Posters, being usually displayed in public places, are likely to attract attention more readily than either exhibitions or filmshows, attendance at either of which requires willingness and effort on the part of farmers. The relatively low percentage who mentioned general meetings, particularly with reference to information about the plow, indicates a low use of this channel to disseminate information at this stage.

Interest Stage

At this stage the individual seeks additional information about a practice, his interest having been aroused by what he now knows.

The data (Table 3) reveal that farmers obtained detailed information about the four practices from all five sources, but through only three channels. More than 75 percent reported VLWs as a source of detailed information about each of the practices, but other sources were reported to a far lesser extent. In each case, less than 10 percent cited neighbors and Sarpanches, while AEO citations ranged from 55 percent on the plow to 21 percent on wheat, and CEP citations ranged from 34 percent (plow) to 16 percent (fungicide). VLWs, AEOs, and CEPs were apparently considered to know more about the practices than local sources. The heavier use of VLWs may be due to their accessibility; they live in the villages, while AEOs and CEPs do not.

Large percentages of respondents reported receiving detailed information at this stage from radio, printed matter, and general meetings. Use of channels ranged from 51 percent for printed matter (on the plow), to 17 percent for printed matter (again on the plow). This indicates the potential for use of the written word as an important channel, particularly with increases in levels of literacy. Both radio and printed matter as channels of communication are positively and significantly associated with the interest stage.

Evaluation Stage

At the evaluation stage, a farmer looks for evidence on which to judge the applicability of a practice in his own situation. He is particularly concerned with the relative value of the new practice and the traditional one it might replace. Data (Table 4) show that among the sources, neighbors received the highest percentage of mentions, followed by VLWs, Sarpanches, AEOs, and CEPs. The use of CEPs jumped sharply with respect to the plow.

The only channel cited as being useful at this stage was the demonstration. Well over 50 percent of the respondents reported using demonstrations for evaluating each of the practices, probably because demonstrations

Table 3

Percentage Distribution of Respondents According to Use of Information Sources and Communication Channels at the Interest Stage

Sources and Channels	Improved Practice			
	Wheat (N=175)	Fertilizers (N=167)	Fungicide (N=136)	Plow (N=100)
Sources:				
Neighbors	8.00	7.09	9.67	00.00
Sarpanches	9.70	6.38	4.03	6.38
VLWs	80.00	78.72	73.38	65.95*
AEOs	21.50	24.82	27.41	55.31*
CEPs	20.00	19.14	16.12	34.04*
Channels:				
General Meeting	20.00	28.36	32.25	38.29*
Radio	44.00	48.93	50.00	40.42*
Printed Matter	17.14	18.43	24.19	51.06*

*r significant at .01 level.

Table 4

Percentage Distribution of Respondents According to Use of Information Sources and Communication Channels at the Evaluation Stage

Sources and Channels	Improved Practice			
	Wheat (N=174)	Fertilizer (N=129)	Fungicide (N=120)	Plow (N=28)
Sources:				
Neighbors	97.50	96.12	95.83	92.85*
Sarpanches	27.50	27.00	23.33	39.28*
VLWs	82.70	75.96	82.50	85.71*
AEOs	14.30	22.48	16.66	32.14*
CEPs	16.60	15.50	11.66	57.14*
Channels:				
Demonstrations	58.00	68.99	65.00	82.14*

*r significant at .01 level.

are largely group phenomena in Indian villages. The visual effect of demonstrations is supported by the presence of large number of farmers, who freely discuss among themselves and with the demonstrators the benefits and difficulties of the practice under consideration. But trying a practice, as a result of communication, comes only after an exchange of "notes" with fellow farmers. "People would rather believe people than facts at the evaluation stage."[1]

Trial Stage

Once convinced of the applicability and usefulness of a given farm practice, an individual farmer is confronted with the problem of actually putting it to use on his farm. At this stage, competent assistance and adequate resources are needed. In traditional systems of agriculture an individual first looks to other members of the system to provide him with necessary guidance and help. If the required assistance is considered to be beyond the competence of other members of his system, he may seek outside help. However, those who are first to try a new practice must depend on outside guidance. They may, in turn, help guide other members in the system. It is expected, therefore, that personal information sources play a bigger role at the trial stage than mass media.

Data (Table 5) indicate the relative uses made of information sources at the trial stage. Of personal sources, neighbors were less frequently cited than VLWs, who ranked first except for the plow, and CEPs had the highest percentage of mentions. In each of the sample villages there were a few innovators who tried these practices first. Although they were expected to play an important role in guiding other farmers, they were recognized by only a small percentage of the respondents. No channels at all were mentioned by respondents at this stage. In the tradition-oriented society of Sehore, extension agents are more heavily relied upon to provide guidance in trying out recommended farm innovations than are local sources.

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[1]Boddewyn, as quoted by Rogers, Diffusion of Innovations (New York: The Free Press of Glencoe, 1952) p. 100.

Table 5

Percentage Distribution of Respondents According to Use of Information Sources and Communication Channels at the Trial Stage

Sources and Channels	Improved Practice			
	Wheat (N=163)	Fertilizers (N=108)	Fungicide (N=117)	Plow (N=18)
Sources:				
Neighbors	8.10	7.50	4.78	5.55
Sarpanches	7.10	7.00	9.40	0.00
VLWs	77.10	81.48	76.92	61.11*
AEOs	17.60	25.92	18.80	38.88*
CEPs	14.30	14.81	10.25	77.77*

*r significant at .01 level.

Decision to Adopt

All of the respondents adopting improved farm practices reported that experience with the trial stage motivated them to continue the practices. This suggests that personal experience is the most important single factor influencing the final decision to adopt or reject a practice.

Successful practice adoption requires the cumulative effect of experiences at each stage in the process. An individual who has satisfying experiences initially may keep moving ahead on the adoption continuum. It is imperative, therefore, that farmers be exposed to facts related to improved farm practices repeatedly and in a variety of ways. Fliegel[1] says "The greater the exposure to media, the greater the adoption of farm practice."

In this study, a positive and significant correlation (.73) was found between adoption scores and exposure to information sources and communication channels. This suggests that the adoption of improved farm practices increases in proportion to farmers' contacts with various information sources and with exposure to channels through which information is communicated.

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[1]F. C. Fliegel, "A Multiple Correlation Analysis of Factors Associated with the Adoption of Farm Practices," Rural Sociology, Vol. 21 (December, 1956), pp. 284-92.

Influence of Sources and Channels

To determine the relative influence of identified information sources and communication channels in the process of adoption, a step-wise regression analysis was performed. Information sources and communication channels were considered as independent variables, and adoption process as the dependent variable. Sources and channels were grouped as follows:

Extension agents - VLWs, AEOs, CEPs

Local sources - Sarpanches and neighbors

Mass media - Radio, posters, filmshows, exhibitions, printed matter

Demonstrations

Meetings

Personal contacts between respondents and extension agents alone accounted for 51 percent of the variability in respondents' adoption sources. Personal contacts between respondents and extension agents and demonstrations together explained 55 percent (R^2 = .548) of the variation in scores. When personal contacts between respondents and their neighbors and Sarpanches were also taken into account, i.e., in addition to demonstrations and personal contact with extension agents, the percentage of variation explained went up to 58 percent, (R^2 = .578). The addition of meetings raised the explained variation to 59 percent (R^2 = .595). Mass media (radio, posters, exhibitions, printed matter, filmshows) together with personal contacts between respondents and extension agents, neighbors, Sarpanches, demonstrations, and meetings explained 60 percent (R^2 = .597) of variability in the adoption scores. Thus, 60 percent of the variability was explained by these sources and channels.

In another stepwise regression analysis, it was found that 79 percent of the variability in adoption scores is explained by identified sources and channels and personal characteristics -- specifically age, education, caste, economic status, and participation in organizations. The remaining 21 percent of variability is assumed to be due to other social, cultural, and situational factors not dealt with here.

Personal contacts between respondents and extension agents (VLWs, AEOs, CEPs) had greater influence on the adoption of improved farm practices

than did personal contacts between respondents and local sources of information. Demonstrations influenced respondents more than did either meetings or mass media.

Communication Related to Respondent Characteristics

It has been postulated by several researchers that personal characteristics influence the use of information sources and channels in the adoption of farm innovations. In this study, the age, education, caste, economic status, and organization participation of respondents were taken as factors to find how far they influence use of identified sources and channels in the adoption of the four practices considered.

Age

The age of respondents varied from 20 to 70 years. The following age categories were formed and used for analysis:

Young - 35 years and below
Middle - 36 to 55 years
Old - 56 years and above

Data (Table 6) show that age is not an important discriminating factor in the use of any of the five identified sources. No significant differences were found in the proportion of mentions by respondents belonging to the three age categories.

Age is also unimportant as a discriminating factor in the use of six of the seven identified channels. Differences in the proportion of mentions by respondents of different age groups for filmshows are almost nil; and for radio, posters, exhibitions, printed matter, and general meetings, the differences were found not to be statistically significant. Only in the case of demonstrations were differences in the proportion of mentions in the young, middle, and old age groups found to be statistically significant.

These data indicate that farmers less than 35 years old are more favorably disposed towards demonstrations than are older ones. Perhaps young farmers do not have as many inhibitions, status positions to maintain, and vested interests to defend as do their elders. Also, they are not committed

Table 6

Percentage Distribution Showing Relation Between Age and Information Sources and Communication Channels Used

Sources and Channels	Young 20-35 N=83	Middle 36-55 N=86	Old 56+ N=31
Sources:			
Neighbors	100.00	100.00	100.00
Sarpanches	21.68	19.70	57.54
VLWs	72.27	74.28	67.32
AEOs	16.86	10.46	12.90
CEPs	14.45	19.76	19.35
Channels:			
Demonstrations	57.83	51.16	29.03*
General Meetings	20.48	22.09	19.35
Radio	37.34	40.69	19.35
Posters	34.93	39.53	25.29
Filmshows	33.73	32.55	32.25
Exhibitions	25.30	29.06	16.30
Printed Matter	16.86	16.27	9.68

*X^2 significant at .10 level with 2 d.f.

to uphold traditional values to the same extent as their elders, and are more anxious to learn new ways of doing things. They may be generally more easily motivated to participate in extension programs than are their elders. VLWs, therefore, should seek the active cooperation and participation of farmers less than 35 years old in demonstrations and other contacts. Young farmers may be more willing than their elders to provide land and other materials for demonstrations.

Education

Education is considered by many to be a panacea for all social and economic ills. It is viewed as a means of providing knowledge and developing rational behaviors and favorable attitudes toward innovation. The basic assumption is that formal education facilitates learning and that, with learning, a farmer becomes more favorably disposed to technological innovations.

Fifty-eight percent of the farmers did not know how to read and write; 6 percent could read and write simple Hindi; and 35 percent had attended school up to the 4th grade. These groupings were labelled as illiterate, literate, and elementary school levels, respectively (Table 7).

Table 7

Percentage Distribution Showing Relation Between Educational Level and Information Sources and Communication Channels Used

Sources and Channels	Illiterate (N=117)	Literate (N=13)	Elementary School (N=70)
Sources:			
Neighbors	100.00	100.00	100.00
Sarpanches	26.40	23.07	25.71
VLWs	69.52	84.62	74.29
AEOs	13.67	23.07	25.71+
CEPs	16.23	15.38	20.00
Channels:			
Demonstrations	47.86	76.92	50.00+
General Meetings	14.52	38.46	28.57*
Radio	35.04	30.76	45.71*
Posters	23.93	46.15	54.28*
Filmshows	30.76	46.15	34.28
Exhibitions	15.38	30.76	41.42*
Printed Matter	00.00	23.07	40.00*

*X^2 significant at .01 level with 2 d.f.
+X^2 significant at .10 level with 2 d.f.

No significant differences were found among the categories with respect to respondents' use of neighbors, VLWs, Sarpanches, and CEPs as sources of information.

However, farmers in the two upper educational categories obtained farm information from AEOs more than did illiterate respondents. Significant differences were found in the proportion of mentions by respondents in the three categories. This suggests that AEOs are more effective with farmers who are literate or who have had some formal education than with farmers

who are illiterate. It appears that illiterate farmers are relatively more satisfied with the knowledge and guidance provided by VLWs, and do not feel the necessity of obtaining information from technically more competent sources. On the other hand, a keen desire to learn more about improved farm practices motivates farmers having literacy or school education to obtain information from AEOs.

It was found, as expected, that farmers having elementary education use the mass media -- radio, exhibitions, and printed matter -- more than do respondents who are illiterate or literate. Differences in the proportion of mentions by respondents of the three educational backgrounds were found to be statistically significant for radio, posters, exhibitions, and printed matter.

This finding leads to the conclusion that farmers with school education better understand, and probably place higher credibility on, messages communicated through radio, exhibitions, and printed matter than do illiterate farmers. Extension workers, therefore, may expect to communicate farm information effectively to educated farmers through radio, exhibitions, and printed matter, but should use other means of communication (such as personal contacts) with literate and illiterate farmers.

These data further reveal that literate farmers use demonstrations and general meetings more than do either illiterate or elementary-school-educated respondents. Significantly large proportions of literate respondents used demonstrations (76 percent) and general meetings (38 percent) for obtaining farm information.

Literate farmers tend to give high credibility to information obtained in general meetings and demonstrations, as they are able to make use of two avenues of learning -- hearing and seeing. VLWs, therefore, should conduct demonstrations on the fields of young and literate farmers. Additionally, general meetings may be expected to bring awareness and arouse interest among literate farmers.

Economic Status

Several researchers have pointed out that size of farm, type of farming, level of income, and other similar economic factors are positively

related to the adoption of improved farm practices. Viewing adoption as a consequence of communication, an analysis was made to find how economic status affects the choice of information sources and communication channels in obtaining farm information.

Three categories of judges -- Sarpanches, Village Record Keepers, and the respondents -- were used to determine the economic status of each respondent. Each judge was asked to categorize individual respondents on a three-point scale -- below average, average, and above average. The resultant relative, but not absolute, categories were used to obtain a rank ordering of respondents' economic status scores. Thus, respondents were categorized into high, average, and low economic status groups. Twenty-five percent were found to have high, 38 percent average, and 38 percent low economic status.

Table 8 presents a percentage distribution of respondents according to economic status and use of information sources and channels of communication relative to the four improved farm practices.

According to the percentage of mentions, neighbors ranked first among the three economic status groups, followed by VLWs. The two professionally most competent information sources, the AEOs and the CEPs, had more contacts with respondents in the high economic status group than with respondents of the average and low economic status groups.

Differences in the proportion of mentions of Sarpanches by the three groups are statistically significant. This suggests that a greater proportion of respondents of average economic status seek information from Sarpanches than do the other two groups.

AEOs were cited by a larger proportion of respondents of high economic status than by the other two groups. These differences, which are statistically significant, emphasize a differential use of AEOs by respondents. Differences between the three groups on their use of VLWs and CEPs are not statistically significant.

It is clear from the foregoing analysis that economic status does affect the use of two sources, AEOs and Sarpanches, but does not do so in the use of neighbors, VLWs and CEPs.

Table 8

Percentage Distribution Showing Relation Between Economic Status and Information Sources and Communication Channels Used

Sources and Channels	Low Economic Status (N=75)	Average Economic Status (N=75)	High Economic Status (N=50)
Sources:			
Neighbors	100.00	100.00	100.00
Sarpanches	17.30	34.66	28.00*
VLWs	68.00	82.66	62.00
AEOs	12.00	17.33	30.60*
CEPs	12.00	20.00	22.00
Channels:			
Demonstrations	41.33	56.00	56.00
General Meetings	14.66	26.66	22.00
Radio	37.33	30.60	40.00*
Posters	20.00	46.60	42.00*
Filmshows	30.66	40.00	26.00
Exhibitions	13.30	30.66	40.00
Printed Matter	9.33	12.00	30.00*

*X^2 significant at .05 level with 2 d.f.

Among the different communication channels, demonstrations had the highest proportion of mentions by respondents from each of the three groups. The large variation in the proportion of mentions by the three groups for other channels is indicative of a differential use pattern of these channels.

Farmers in the highest economic status group used radio, posters, exhibitions, and printed matter more than did farmers in the low and middle economic status groups. A significantly large proportion of respondents belonging to the high economic status group obtained farm information through radio, posters, exhibitions, and printed matter (40, 42, 40, and 30 percent, respectively).

Farmers of above average economic status use mass media in order to remain better informed about developments in farm technology more than do those of average and below average economic status. Extension workers, therefore, may expect to communicate farm information effectively through

mass media to farmers of above average economic status, but will have to contact other farmers personally.

Caste

The farmers studied belonged to a number of castes and sub-castes. For purposes of analysis, the following categories were formed in accordance with traditional local classifications:

Upper caste: Respondents belonging to the Brahmin caste.

Middle caste: Respondents belonging to the Thakur, Khati, Carpenter, Blacksmith, and other occupational castes.

Lower caste: Respondents belonging to the Gond, Mahar, Basod, and other scheduled castes.

Four percent of the respondents belonged to the first category, 69 percent to the second category, and 27 percent to the third category. Table 9 gives a percentage distribution of respondents belonging to these three caste categories according to their use of sources and channels in the adoption of improved farm practices.

In all caste categories, neighbors ranked first as a source of information, followed by VLWs, Sarpanches, AEOs, and CEPs. No significant differences were found in the proportion of mentions by respondents of each caste group for neighbors and VLWs. However, a larger percentage of respondents belonging to the middle-caste group mentioned AEOs, Sarpanches, and CEPs than did either upper- and lower-caste respondents. This indicates that respondents belonging to the middle-caste group obtained more information from the VLWs, AEOs, Sarpanches, and CEPs than did respondents of the upper- and lower-caste groups. This is logical, because the middle-caste group is comprised mainly of cultivating castes who are traditionally considered to be good farmers. However, differences in the proportion of mentions between the three caste groups for all sources, except CEPs, are not statistically significant. For CEPs, differences are significant only at the .10 level.

Demonstrations and general meetings were more popular channels with upper-caste respondents than with those of middle and lower castes. This finding is in contradiction to expectations. It was expected that the

Table 9

Percentage Distribution Showing Relation Between Caste and Information Sources and Communication Channels Used

Sources and Channels	Lower Caste (N=53)	Middle Caste (N=139)	Upper Caste (N=8)
Sources:			
Neighbors	100.00	100.00	100.00
Sarpanches	16.98	30.21	25.00
VLWs	63.87	75.23	62.50
AEOs	15.09	20.14	12.50
CEPs	7.54	21.58	12.43+
Channels:			
Demonstrations	100.00	49.64	75.00
General Meetings	13.20	23.02	37.50
Radio	24.52	43.16	50.00*
Posters	22.64	40.28	50.00+
Filmshows	22.64	35.25	62.50*
Exhibitions	13.20	30.21	25.00*
Printed Matter	9.43	16.54	25.00*

*X^2 significant at .05 level with 2 d.f.
+X^2 significant at .10 level with 2 d.f.

middle-caste group would mention demonstrations in larger proportions than the other two groups. Being recognized as good farmers, they were thought likely to participate more in demonstration programs. The higher proportion of mentions by upper-caste respondents may be due to the sample size.

With the exception of exhibitions, more respondents belonging to the upper-caste group reported obtaining information through mass media than did respondents of the middle- and lower-caste groups (Table 9). But a greater proportion of respondents in the middle-caste group cited exhibitions than in the upper- and lower-caste groups. (The percentages being 30, 25, and 13, respectively).

Differences in the proportion of mentions of different mass media by the three caste groups are statistically significant. These differences

may be due largely to disparities in social and educational backgrounds. Upper-caste respondents are locally considered to be intellectuals; their general comprehension and ability to read and write are considered to be above average. They also enjoy high social status in village life. It is natural, therefore, to expect them to have wider contacts, both in and outside the villages.

Organizational Participation

Respondents' participation in formal village organizations is related to their use of sources and channels. There were only two formal organizations functioning in the sample villages: Panchayats[1] and Service Cooperative Societies. Respondents were grouped into three categories: high, medium, and low, according to membership status and extent of participation in these organizations.

Table 10 presents percentage distributions for those respondents with high, medium, and low participation in these village organizations who obtained farm information from various sources and channels. Data show that neighbors were cited equally by all three groups. The percentage of respondents with high and low participation who cited Sarpanches as a source of farm information was small (15 and 22 percent, respectively) in comparison with respondents of medium participation (52 percent). This indicates that Sarpanches were most active with the middle group, although differences are not statistically significant.

VLWs were cited by a greater proportion of respondents (92 and 71 percent, respectively) having high and low participation than of respondents with medium participation (58 percent). Differences in these proportions are statistically significant.

AEOs were mentioned about equally by respondents of high and medium organization participation. However, quite pronounced differences exist between respondents of high or medium organization participation and those of low participation. The proportion of mentions for both the former are larger than for the latter by about 23 percent. Statistically, these differences are significant.

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[1]Local self-government councils.

Table 10

Percentage Distribution Showing Relation Between Organizational Participation and Information Sources and Communication Channels Used

Sources and Channels	Low Participation (N=140)	Medium Participation (N=34)	High Participation (N=26)
Sources:			
Neighbor	100.00	100.00	100.00
Sarpanch	22.14	52.94	25.38*
VLWs	71.42	58.82	92.30*
AEOs	12.80	35.29	34.64*
CEPs	14.20	23.52	34.61*
Channels:			
Demonstrations	50.00	35.29	73.07*
General Meetings	12.14	26.47	61.53*
Radio	21.30	61.76	100.00*
Posters	25.71	52.94	69.23*
Filmshows	19.28	50.00	84.61*
Exhibitions	14.20	41.17	61.53*
Printed Matter	5.00	23.52	57.69*

*X^2 significant at .05 level.

Thus, respondents of high or medium organization participation made more use of AEOs than did respondents of low organization participation. Similarly, larger proportions (23 percent and 34 percent, respectively) of respondents having medium and high participation used CEPs than did those who had low participation (14 percent). These differences are also statistically significant, emphasizing the differential use of CEPs according to the extent of participation of respondents in village organizations.

These findings suggest that respondents who are active in village organizations tend to make greater use of technically competent sources of information.

The three categories differ markedly in the proportions of mentions of the use of communication channels. Increases in participation scores were accompanied by increases in the use of various mass media.

Demonstrations were mentioned in larger proportion by respondents of high and low participation (75 percent and 50 percent, respectively) than by respondents of medium participation (35 percent). Differences in these proportions are statistically significant.

Larger proportions of respondents belonging to high and medium participation categories mentioned meetings, posters, filmshows, exhibitions, radio, and printed matter, than did respondents belonging to the low participation category. Statistically, differences are highly significant for all channels. This confirms that with increased organizational participation respondents make more use of mass media for obtaining farm information.

Additionally, it was found that a significantly larger proportion of respondents belonging to the high participation category reported obtaining farm information through personal contacts with extension agents and mass media than did respondents with low organization participation.

Conclusions

It is concluded from the foregoing findings that current hypotheses about the role of information sources and communication channels in farm practice adoption, developed largely in the United States, may not have cross-cultural validity. In particular, hypotheses about the role of mass media in the farm practice adoption process were not supported by the findings of this study.

Mass media were used by relatively small percentages of respondents. By and large, oral communication in face-to-face situations plays a more important role at each stage of the adoption process than communication through impersonal media, which is apparently less effective. In general, farmers were found to learn new things by hearing, seeing, and doing through interpersonal contacts. The written word does not have as much effect as it apparently does in developed societies.

Education, economic status, and caste membership are important factors affecting the use of modern means of communication by farmers in the sample. A majority of farmers do not know how to read and write. This limitation imposes restrictions on their ability to understand and comprehend

messages relayed through mass media. Farmers in the sample generally learn through what they hear from neighbors, friends, relatives, local leaders, and extension agents. They believe in what they see, and practice what they actually learn to do.

Economic status further affects the use of modern means of communication. A farmer often cannot afford to buy a radio or a farm newspaper, even if he can read and write. He has, therefore, to remain contented with more traditional ways of learning.

Caste determines the opportunities for social participation and group learning. It is, therefore, imperative for extension workers in the block to communicate with their clientle in face-to-face situations.

An implication of these findings is that VLWs, if they are in fact to be key communicators, should have a thorough knowledge of agricultural subject matter and understand the communication process. To achieve this high level of professional competency, it is essential that VLWs be given continuous and progressive training in agricultural subject matter and the techniques of extension teaching and communication on an organized basis.

In summary, then, the following generalizations are drawn from the study:

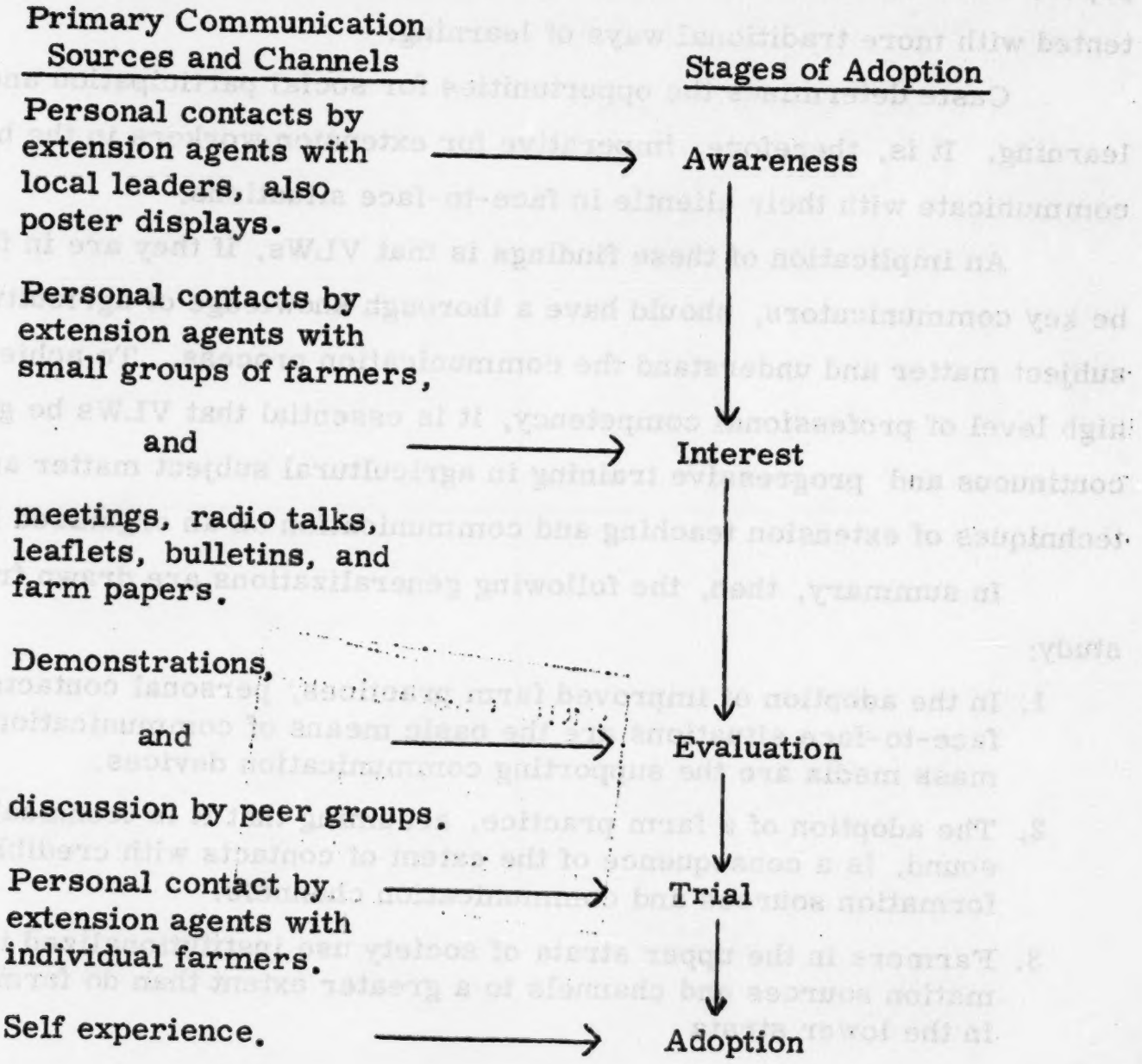
1. In the adoption of improved farm practices, personal contacts in face-to-face situations are the basic means of communication, and mass media are the supporting communication devices.
2. The adoption of a farm practice, assuming that it is technically sound, is a consequence of the extent of contacts with credible information sources and communication channels.
3. Farmers in the upper strata of society use institutionalized information sources and channels to a greater extent than do farmers in the lower strata

Application of Findings

Findings relating the use of information sources and communication channels to different stages in the adoption process are useful in outlining a communication strategy to move farmers along the adoption continuum. The following paradigm indicates how findings from this study may be used to improve extension programs for communicating technology to

farmers. Although incomplete and illustrative only, the sources and channels included in the paradigm are basic and, using more complete data, point to the potential development of strategy "maps" for improving the effectiveness of communication activity.

A Paradigm for Communicating Agricultural Technology to Indian Farmers[1]



To interest farmers in recommended farm practices, VLWs and other extension personnel need to provide them with more detailed information. This task can best be accomplished through personal contacts with farmers in small

[1]Source: D. K. Sharma, Doctoral Dissertation in Extension-Adult Education, "Information Sources and Communication Channels Related to Farm Practice Adoption in Central India", Cornell University, 1967.

groups and by enhancing the effects by communicating detailed information about farm practices through general meetings and radio talks. The distribution of leaflets and bulletins to farmers having formal education is also recommended.

To help farmers evaluate the usefulness and local applicability of recommended farm practices, extension workers should insure that successful demonstrations are conducted in each village. To enable farmers to try a practice, extension workers must get the visual evidence of demonstrations validated by peer groups. It is therefore essential to secure participation and involvement of peer groups in all demonstrations. This will provide them with similar learning experiences and enable them to compare notes in validation of the evidence.

At the trial stage, technically competent help is of the utmost importance. The VLWs and AEOs should, therefore, supervise and guide each agricultural operation related to recommended farm practices at the trial stage to enable cooperators to learn the correct ways of doing things.

Whether a practice is adopted depends largely upon a farmer's personal experience at the trial stage. Hence, VLWs and AEOs, particularly, must make all-out efforts at this stage to assure that farmers have satisfying experiences.

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